

**Montana Board of Oil and Gas Conservation
Environmental Assessment**

Operator: Emerald Oil, Inc

Well Name/Number: Michelangelo 1-1-12-13H

Location: Lot 3 Section 1 T24N R58E

County: Richland, MT; Field (or Wildcat) W/C (Bakken Horizontal)

Air Quality

(possible concerns)

Long drilling time: No, 20 to 30 days drilling time.

Unusually deep drilling (high horsepower rig): No, triple derrick drilling rig to drill a single lateral Bakken Formation well, 22,114'MD/10,531'TVD.

Possible H₂S gas production: Yes possible H₂S gas, slight chance from Mississippian Formations.

In/near Class I air quality area: No Class I air quality area in the area of review.

Air quality permit for flaring/venting (if productive) Yes, DEQ air quality permit required under rule 75-2-211.

Mitigation:

☐ Air quality permit (AQB review)

☐ Gas plants/pipelines available for sour gas

☐ Special equipment/procedures requirements

☐ Other: _____

Comments: No special concerns – using triple derrick drilling rig to drill a single lateral horizontal Bakken Formation well, 22,114'MD/10,531'TVD. If existing gas gathering system for natural gas in the area, associated gas can be gathered or if no gathering system nearby, associated gas can be flared under Board Rule 36.22.1220.

Water Quality

(possible concerns)

Salt/oil based mud: Yes, oil based invert mud system will be used for drilling the mainhole (oil/water ratio 70/30 invert mud) and saltwater for drilling the horizontal lateral. Freshwater and freshwater mud system will be used for drilling the surface hole, Rule 36.22.1001.

High water table: No, high water table at this well location.

Surface drainage leads to live water: No, closest drainage is an unnamed ephemeral tributary to Second Hay Creek, about 3/5 of a mile to the east from this location and an unnamed ephemeral tributary to North Fork First Hay Creek, about 1/10 of a mile south. Second Hay Creek is located about 2.5 miles to the northeast. North Fork First Hay Creek is located about 4/5 of a mile to the south.

Water well contamination: None, closest water well is about 1/4 of a mile to the southeast. Depth of this domestic well is 245'. Surface hole will be drilled with freshwater and freshwater mud to 1944', rule 36.22.1001. Steel surface casing will be run and cemented from 1944' to surface.

Porous/permeable soils: No, sandy silty clay soils.

Class I stream drainage: No Class I stream drainages in the area of review.

Mitigation:

☐ Lined reserve pit

- ☒ Adequate surface casing
- ☐ Berms/dykes, re-routed drainage
- ☒ Closed mud system
- ☒ **Off-site disposal liquids (in approved facility)**
- ☐ Other: _____

Comments: 1944' of surface casing cemented to surface adequate to protect freshwater zones and will cover the base of the Fox Hills Formation, Rule 36.22.1001.

Soils/Vegetation/Land Use

(possible concerns)

Stream crossings: Yes, an unnamed ephemeral drainage to North Fork First Hay Creek.

High erosion potential: Yes, possible high erosion potential with a large cut, up to 24' and moderate fill, up to 11.1', required.

Loss of soil productivity: None, location to be restored after drilling well, if well is nonproductive. If productive unused portion of drillsite will be reclaimed.

Unusually large wellsite: No, a large location, 350'X400' location size required for two wells, the Michelangelo 1-1-12-13H and the Michelangelo 2-1-12-13H.

Damage to improvements: Slight, surface use is cultivated land.

Conflict with existing land use/values: Slight

Mitigation

- ☐ Avoid improvements (topographic tolerance)
- ☐ Exception location requested
- ☒ Stockpile topsoil
- ☐ Stream Crossing Permit (other agency review)
- ☒ Reclaim unused part of wellsite if productive
- ☐ Special construction methods to enhance reclamation
- ☐ Other: _____

Comments: Access to location will be over existing Highway 201. An access road of 392' will be built off the county road into this location. Oil based invert drilling fluids will be hauled to North Dakota to a Class II Disposal. Cuttings will also be hauled off to Indian Hills Disposal in North Dakota. No special concerns.

Health Hazards/Noise

(possible concerns)

Proximity to public facilities/residences: Nearest residences is about 7/10 of a mile to the east, 1.3 miles to the southeast, 1.4 miles west, and 1.2 miles south from this location. The town of Fairview, Montana is about 8.5 miles to the east from this location.

Possibility of H2S: Slight possibility of H2S from Mississippian Formations.

Size of rig/length of drilling time: Triple drilling rig/short 20 to 30 days drilling time.

Mitigation:

- ☒ Proper BOP equipment
- ☐ Topographic sound barriers
- ☐ H2S contingency and/or evacuation plan
- ☐ Special equipment/procedures requirements
- ☐ Other: _____

Comments: Adequate surface casing and operational BOP equipment should mitigate any problems. (BOP's 5,000 psig annular, pipe and blind rams) rule 36.22.1014. No concerns.

Wildlife/recreation

(possible concerns)

Proximity to sensitive wildlife areas (DFWP identified): None identified.

Proximity to recreation sites: None identified

Creation of new access to wildlife habitat: No

Conflict with game range/refuge management: No

Threatened or endangered Species: Species identified as threatened or endangered are the Pallid Sturgeon, Interior Least Tern, Whooping Crane and Piping Plover.

Candidate species are the Greater Sage Grouse and the Sprague's Pipit. MTFWP Natural Heritage Tracker website indicates one (1) species of concern: the Whooping Crane.

Mitigation:

☐ Avoidance (topographic tolerance/exception)

☐ Other agency review (DFWP, federal agencies, DSL)

☐ Screening/fencing of pits, drillsite

☐ Other: _____

Comments: Private cultivated surface lands. There may be species of concern that maybe impacted by this wellsite. We ask the operator to consult with the surface owner as to what he would like done, if a species of concern is discovered at this location. The Board of Oil & Gas has no jurisdiction over private surface lands.

Historical/Cultural/Paleontological

(possible concerns)

Proximity to known sites None identified.

Mitigation

☐ avoidance (topographic tolerance, location exception)

☐ other agency review (SHPO, DSL, federal agencies)

☐ Other: _____

Comments: Private cultivated surface lands. There may be possible historical/cultural/paleontological sites that maybe impacted by this wellsite. We ask the operator to consult with the surface owner as to his desires to preserve these sites or not, if they are found during construction of the wellsite. The Board of Oil & Gas has no jurisdiction over private surface lands.

Social/Economic

(possible concerns)

☐ Substantial effect on tax base

☐ Create demand for new governmental services

☐ Population increase or relocation

Comments: Wildcat well, no concerns.

Remarks or Special Concerns for this site

Emerald Oil, LLC to drill a wildcat single lateral horizontal Bakken Formation well,
22,114'MD/10,531'TVD.

Summary: Evaluation of Impacts and Cumulative effects

No significant long term impacts expected, some short term impacts will occur.

I conclude that the approval of the subject Notice of Intent to Drill (does/**does not**) constitute a major action of state government significantly affecting the quality of the human environment, and (does/**does not**) require the preparation of an environmental impact statement.

Prepared by (BOGC): /s/John Gizicki

(title): Compliance Specialist

Date: September 18, 2014

Other Persons Contacted:

Montana Bureau of Mines and Geology, GWIC website

(Name and Agency)

Water wells in Richland County

(subject discussed)

September 18, 2014

(date)

US Fish and Wildlife, Region 6 website

(Name and Agency)

ENDANGERED, THREATENED, PROPOSED AND CANDIDATE SPECIES

MONTANA COUNTIES, Richland County

(subject discussed)

September 18, 2014

(date)

Montana Natural Heritage Program Website (FWP)

(Name and Agency)

Heritage State Rank= S1, S2, S3, T24N R58E

(subject discussed)

September 18, 2014

(date)

Montana Cadastral Website

(Name and Agency)

Surface Ownership and surface use Section 1 T24N R58E

(subject discussed)

September 18, 2014

(date)

If location was inspected before permit approval:

Inspection date: _____

Inspector: _____

Others present during inspection: _____